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Summary of a Competency Based, Field Centered, Systems Approach to Elementary Teacher Education. Summary of the Final Report.

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A competency-based, field-centered systems approach to elementary school teacher education was designed to bring about specified, measurable outcomes, to have evidence of its effectiveness continually available, and to be adaptive in the light of that evidence. The model was separated into two interdependent parts, the instructional model and the management model. For the instructional model, teacher behaviors were systematically derived and specified for the prime objective of teacher education (preparing teachers who can bring about appropriate changes in pupil behavior) as well as for noninstructional tasks, and instructional guidelines were written for the inclusion in the model of instructional systems technology, behavior evaluation strategies, a personalization process leading to the development of a personal teaching style, and preservice mastery of teaching competencies. A systematically designed management model, served by a computer-based information management system, controls the evaluation and adaptive functions and costing data. Model and program specifications were developed for the instructional content and organization of the program based on analyses of predictions for 1970, providing for a three-phase program (foundations, laboratory, and practicum) to be integrated into general and inservice education. Content specifications were also derived for the management model. (The complete report is contained in ED 026 305-ED 026 331.) (SM)

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SUMMARY OF THE FINAL REPORT

Project No. 8-9022
Contract No. OEC-0-8-089022-3318 (010)

SUMMARY OF A COMPETENCY BASED, FIELD CENTERED, SYSTEMS APPROACH TO ELEMENTARY TEACHER EDUCATION

NORTHWEST REGIONAL EDUCATIONAL LABORATORY

October 1968

The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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SUMMARY*

I. Introduction to the ComField Project

If the aim of teaching is learning then there should be evidence that teachers can bring about appropriate learning in children before they assume responsibility for it in the classroom. The aim of the ComField model is the development of a teacher education program that generates this kind of evidence.

To realize this aim the ComField model specifies that each prospective teacher demonstrate the ability, under both simulated and live classroom conditions, to effect changes in the behavior of pupils that reflect the outcomes desired for them. In addition, the ComField model specifies that each prospective teacher demonstrate that he can effectively perform the noninstructional tasks required of him in a school setting, for example, conferencing with parents or working with research and evaluation teams; that he demonstrate that he can effectively use interpersonal or group process skills to facilitate the application of instructional and noninstructional competencies; and that he demonstrate that he has integrated all professional competencies into a unique and personally relevant teaching style.

Procedurally, the ComField model specifies that "instructional systems" will be employed to bring about professional competencies and their personalization; that instruction within these systems will be individualized with respect to point of entry into the curriculum, pacing, sequencing, information processing preferences, etc.; and that a computer based information management system will be used to handle the frequent and diverse demands upon information created by the above. Two additional procedural requirements are specified: cost/benefit data is to be provided for all aspects of the program, and an adaptive mechanism is to be developed to insure the continuous modification of the program in light of evidence as to its costs, effectiveness and appropriateness. A management model designed to implement these procedures within participating colleges and schools is specified.

A schematic representation of the major components within the ComField model appears as Figure 1.

* - Pages 1 through 36 ("Overview") of final report.

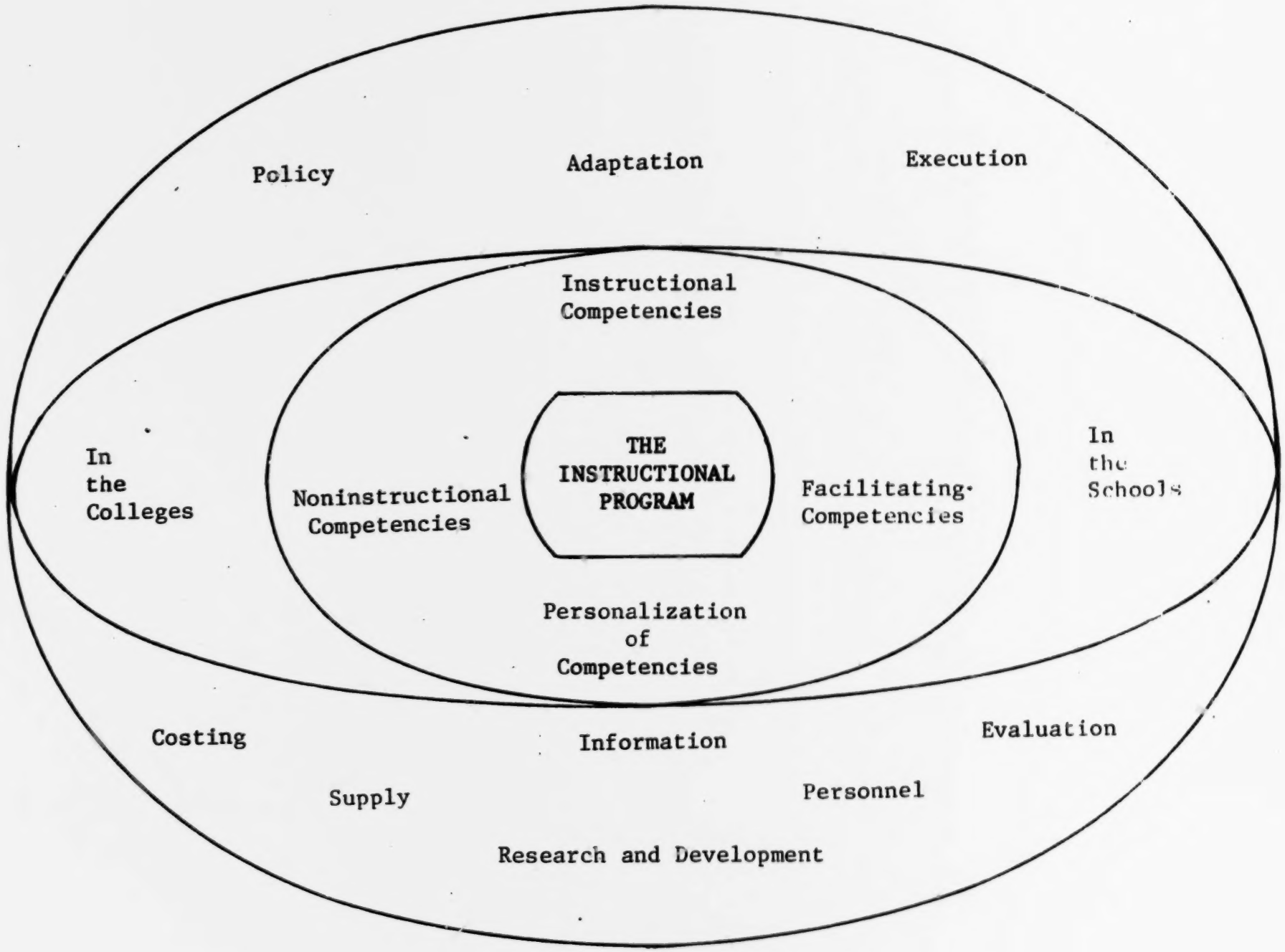

Figure 1. A schematic representation of the ComField Model.

II. The Model as a Process

Each of the functional parts within the ComField model, as well as the model as a whole, has three characteristics:

1) it is designed to bring about a specified and measureable outcome;

2) it is designed so that evidence as to the effectiveness with which it brings about its intended outcome is continuously available; and

3) it is designed to be adaptive or corrective in light of that evidence.

This is the case whether the part in question is an instructional system, the procedure developed to personalize all professional competencies, the instructional program as a whole, or the cost/effectiveness function. As such the model represents a process or way of proceeding. It is "goal oriented," characterized by "systems design" principles, "corrective feedback loops," etc. In short, it is a process that requires its user to a) know what it is that he wants to accomplish, b) order events in such a way that he has some probability of accomplishing it, c) assess whether these events do in fact accomplish that which they are intended to accomplish, and d) if they do not, modify them until they do. This process is represented schematically in Figure 2.

While the incorporation of this process permits a ComField based program to realize its objectives with a known degree of reliability, continuously adapt to needed change, etc., its greatest power probably lies in its generalizeability to the behavior patterns of prospective teachers. As students move through a ComField based teacher education program they are not only made aware of the process by being continuously subjected to it in their own learning, but they are also required to reflect the process in their preliminary teaching. In order to move through the program they have to establish desired pupil outcomes, order events to bring them about, assess progress to see if desired outcomes are being reached, and, if they are not, modify events until they are. A major assumption within the model is that the continous demonstration of this pattern of behavior by prospective teachers will lead to the ultimate goal of any teacher education program, namely, the development of generally adaptive, self-directed career teachers.

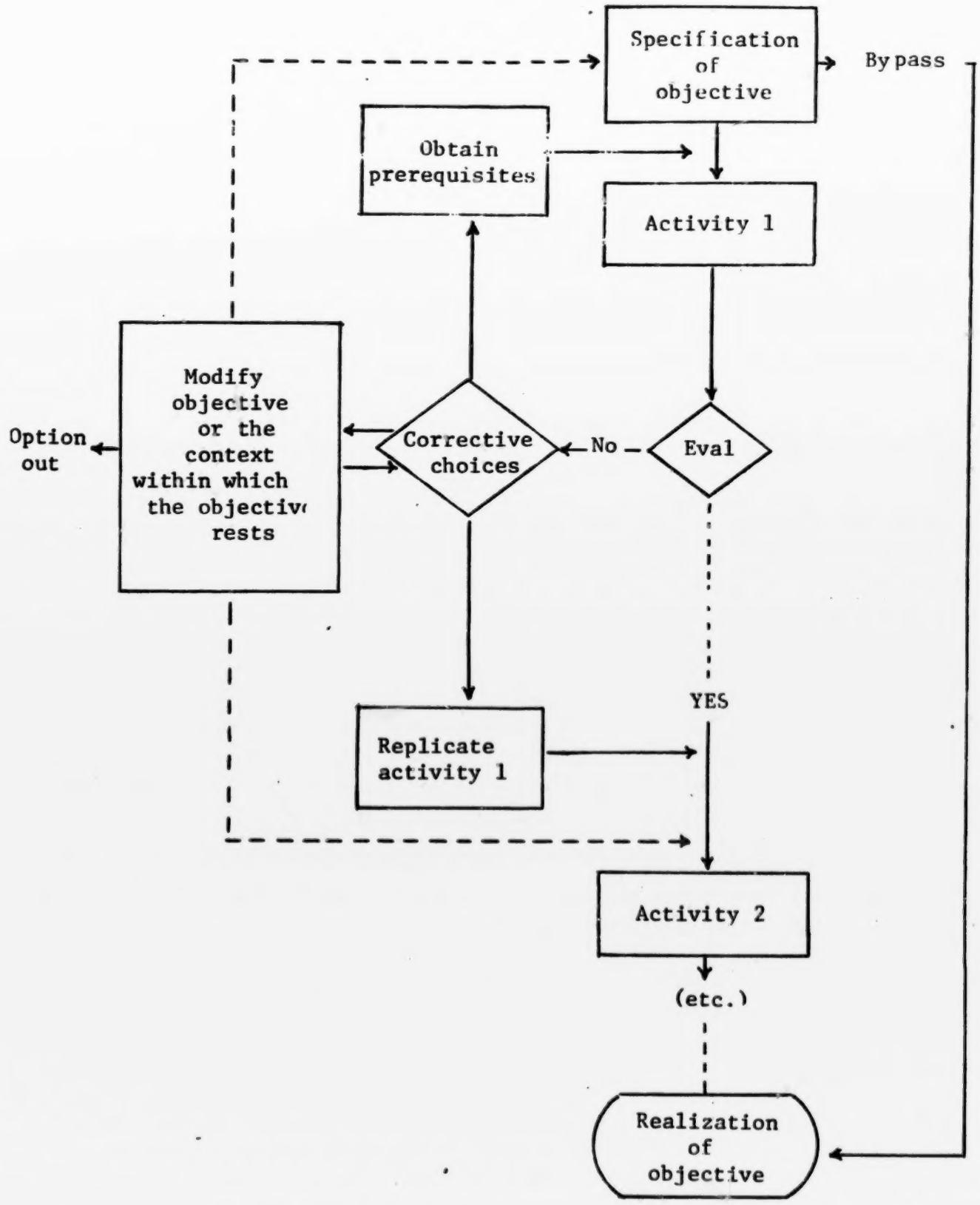

Figure 2. A schematic representation of the adaptive process reflected throughout the ComField model.

III. The Conceptual Framework Underlying the Model

Ten propositions provided the base from which the model was developed. These were:

1) that the objectives of a teacher education program should be specified in terms of the competencies needed by teachers to bring about the outcomes desired in pupils;

2) that overt behavior acceptable as evidence of given teaching competencies should be specified;

3) that systems design principles should be used in the development of instructional experiences to bring about the mastery of teaching competencies;

4) that there should be evidence that professional competencies are integrated into a unique and personal "teaching style," and that a student should be able to be provided a rationale for the application of that style in any given situation;

5) that the desired teaching competencies should be demonstrated under laboratory conditions prior to the assumption of supervised responsibility for the learning of children in the schools, and that they should be demonstrated to criterion under classroom conditions prior to assuming full responsibility;

6) that the instructional experiences that lead to both the development and personalization of competencies should be individualized with respect to point of entry into the curriculum, pacing, sequencing, information processing preferences, etc.;

7) that cost/benefit data should be provided on all aspects of such a program;

8) that an adaptive mechanism should be developed to insure the continuous modification of such a program in light of evidence as to its cost, effectiveness, and appropriateness;

9) that a computer based information management system should be used so as to effectively meet the frequent and diverse demands for information within such a program; and

10) that a model should be developed for the management or execution of such a program that insures as far as possible that it reach the objectives set for it.

Some of these commitments were related to the matter of instruction and some to the matter of management or administration. As a result two inseparably related but distinct models were developed: 1) a model for a competency based, field centered instructional program, and 2) a model for a mangement system which provides the support functions needed by such a program if it is to operate. These are viewed as totally interdependent models and without them both the ComField model is meaningless. Both models carry detailed sets of specifications. The rationale that underlies each is reviewed separately in the pages which follow.

Rationale Underlying the Development of the ComField Instructional Model

Instructional Guideline 1. The content of a teacher education program should be derived systematically.

The first step in the systematic development of a teacher education program is to specify the outcomes that such a program should achieve. At one level this leads to outcome statements such as "effective teaching," or "the development of effective teachers." These are not specific enough for purposes of program design, however, for the term teaching may be used to describe the actions of persons who decide who is to be taught or what is to be taught; or it may describe the actions of persons who guide learners in face-to-face situations. A better definition is "the preparation of persons who can bring about learning in children," or more exactly, "the preparation of persons who can bring about appropriate changes in pupil behavior." When the purpose of a teacher education program is defined in this manner, a basis for the evaluation of teaching and teacher education is set. (For further explication of the basis for evaluation, see Guideline 2, p.8.)

Having established the prime objective of a teacher education program, the next step is to determine how this objective is to be brought about. In terms of a systematic analysis, this requires four interrelated steps:

1) specification of the pupil outcomes desired;

2) specification of the conditions by which each outcome can be realized;

3) specification of the competencies needed by teachers to provide the conditions that are needed for the realization of each outcome; and

4) specification of the conditions by which the needed teacher competencies can be realized.

The logic of such an analysis is straightforward: if one knows the pupil outcomes wanted, and knows what it takes to get them, it should be possible to (a) specify the competencies needed on the part of the teachers to bring given outcomes about, and (b) build a teacher education program that will lead to the development of these competencies. This rationale, as it pertains to the development of a curriculum for a teacher education program, is outlined schematically in Figure 3.

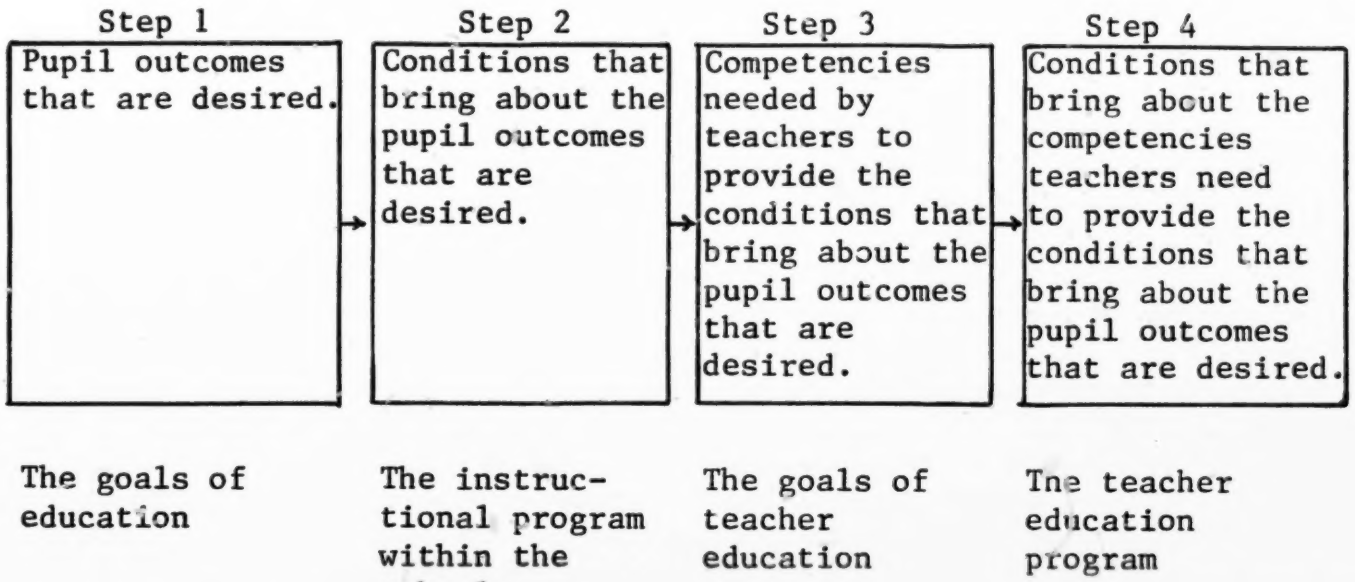
Step 1
Pupil outcomes that are desired.
Step 2
Conditions that bring about the pupil outcomes that are desired.
Step 3
Competencies needed by teachers to provide the conditions that bring about the pupil outcomes that are desired.
Step 4
Conditions that bring about the competencies teachers need to provide the conditions that bring about the pupil outcomes that are desired.
The goals of education
The instructional program within the schools
The goals of teacher education
The teacher education program

Figure 3. A model to be followed in identifying the curriculum of a teacher educational program.

Recognizing the prime objective of teacher education as the preparation of persons who have the ability to bring about appropriate changes in pupil behavior does not eliminate the need to establish other objectives. Teachers must perform tasks that are supportive of their ultimate purpose, for example, conferring with parents or working cooperatively with a research team, and a teacher education program must provide them the competencies to do so. This leads then to another step in the systematic analysis of teacher education, namely, specification of the tasks that teachers need to perform in support of their primary function. Once this is done it needs to be followed by the logical analysis of the competencies it takes to perform them and the instructional conditions required to bring these competencies about. In combination the competencies teachers need to perform their primary and supporting tasks provide the basis for determining the content of a teacher education program.

A complicating factor in a systematic analysis of teacher education is the matter of change. Desired pupil outcomes change, knowledge of the conditions which bring about these outcomes changes, supporting tasks change, etc. Given the element of change, it follows that

teacher education programs must be planned with an eye toward it. Specification of desired learner outcomes has to reflect not only what is presently known about human development, or what is urgently needed by society, but also by what human beings and the social system are likely to need in the future. The specification of tasks supportive to a teacher's primary function suffers the same dilemma. While there obviously are no clear answers to such questions, the designer of teacher education programs must make systematic and educated guesses about them.

> Instructional Guideline 2. The objectives of a teacher education program should be defined in terms of overt behavior that is acceptable as evidence of the realization of those objectives.

In order to know whether an instructional program is effective there must be a way to determine whether it reaches its objectives. This requires not only the explication of objectives, but also an explication of the behavior that one is willing to accept as evidence of those objectives. When definition progresses to this level, assessment becomes possible. Given the constraints of Guideline 1, the behaviors that define the objectives of a teacher education program are either those that lead to appropriate changes in the behavior of pupils or those that lead to success in the pursuit of tasks supportive to behavioral change in pupils.

A complicating factor in specifying the behaviors that one is willing to accept as evidence of the realization of a program objective is the fact that behavior is always situation specific. Operationally this means that the content and strategy involved in instructional behavior must always be defined in terms of their appropriateness to a) a given pupil outcome for b) a given pupil or set of pupils in c) a given instructional setting. The appropriateness of an instructional act in the abstract is a meaningless concept. The variables that need to be considered in judging the appropriateness of an instance of instructional behavior are presented schematically in Figure 5.

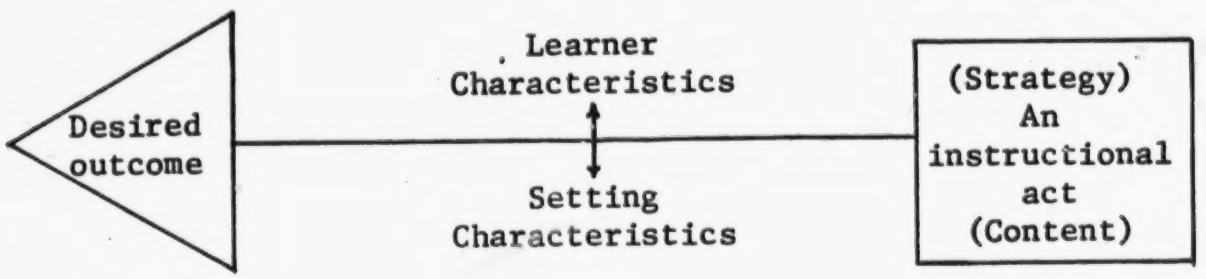

Figure 4. Variables to be considered in judging the appropriateness of a teaching act.

The same rationale applies when judging the appropriateness of a teacher's noninstructional acts: they are always situation-specific, and as a consequence they must always be judged in terms of the outcomes to be achieved by the act, the characteristics of the person to whom the act is directed, and the characteristics of the setting within which the act occurs.

Instructional Guideline 3. Systems design principles should be used in developing learning experiences which lead to the mastery of teaching competencies.

The goal of teaching is learning. This is the case whether teaching is taking place in the second grade or the sophomore year, and whether its focus is mathematics or the preparation of teachers. Because it is behaviorally based, persons adopting the ComField model are in the unique position of being able to insist that known kinds and amounts of learning take place as a consequence of instruction. To give instruction the wherewithal to meet such a demand, the ComField model specifies that instruction should make use of what has come to be known as "instructional systems technology."

An instructional system is an empirically developed set of learning experiences designed to bring about a given outcome for a given class of learners with a given degree of reliability. It involves a systematic analysis of that which is to be learned, a systematic structuring of it from the learner's point of view, and the empirical development of a set of learning experiences which move the student step by step through the structure. Instructional systems are always designed with multiple entry points and multiple paths to pursue, thus permitting students to enter them at levels commensurate with background and progress through them in ways commensurate with learning style. An instructional system is also always dependent upon overt behavior for evidence of the realization of the objectives set for it. In this sense the methodology is a logical extension of Guidelines 1 and 2.

Emphasis upon an instructional systems approach should not be taken to mean that instruction becomes simply a matter of students interacting with electronic media or teaching machines. The systems approach makes use of all instructional strategies that have value in bringing about a given learning outcome. Special lectures, small group discussions, reading, observation of films or real life settings, laboratory simulations, and microteaching experiences are as acceptable to an instructional systems design approach as they are to current educational practice--so long as they are organized around the development of explicit performance outcomes that relate to explicit tasks that the prospective teacher must perform. A major strength of the

instructional systems approach is that each system has built into it provision for review, revision and modification, and thereby correction, if performance from it is below the minimum acceptable level.

Instructional Guideline 4. Provision should be made for individual differences in learning.

Individual differences in the learning patterns or preferences of students in a teacher education program must be more than recognized; they must be taken into account fully in the design of instructional experiences. Operationally this means that instructional systems must be designed with multiple entry points and multiple "critical paths" along which students may move; that multiple media forms be employed so that information processing preferences can be pursued; that rate of progress through a system or through the full contingent of systems be under the control of the student, and that the sequencing of instructional systems be determined as much by the ability to perform as by "curricular structure."

Instructional Guideline 5. Provision should be made to enhance differences in learning outcomes and to help these differences be shaped into personally relevant teaching styles.

Not only do prospective teachers learn differently, but they learn different things and they put together similar things in different ways. Competency A for one teacher, for example, may be translated into instructional behaviors x, y, and z; for another it may be translated into behaviors v, w, and x — yet both teachers may be equally successful in bringing about a desired outcome in pupils. In planning a competency based teacher education program, differences in the expression of competencies must be encouraged and provision must be made whereby these differences can be integrated into an idiosyncratic teaching style.

The adoption of a behavorially based program of instruction, or the use of instructional systems that "are designed to produce a given outcome with a given degree of reliability," does not require that students emerge from the program as carbon copies. While it is true that each student must be able to perform given teaching competencies to criterion, there are different ways in which this can be done. In ComField each student is encouraged to seek out the way which is most appropriate to him as an individual. This process has come to be called the "personalization" of teaching competencies and refers generally to the process by which a prospective teacher internalizes the instructional competencies he masters, gives them value, and integrates them into a unique style or pattern that fits him as a person.

Three provisions are made in the model for the personalization process:

1) fostering an understanding of one's self,

2) continuous opportunity to explore the value or meaning or relevance of particular competencies for one's self,

3) freedom and encouragement to develop a style of teaching that is in concert with one's self.

Operationally, these provisions are to be used in two somewhat different ways. First, they form the basis for a set of instructional systems designed to initiate the process of self-understanding, commitment and search for teaching style. Second, and more importantly, they constitute an integral part of every instructional system that is designed to bring about a given professional competency. As a student moves through such a system he always has the option of pursuing the meaning of the competency for himself personally, his commitment to it, and how he can integrate it into an evolving teaching style. Also each time a competency is assessed it is done so from the point of view of these three factors, as well as its performance qualities. Whenever there is reason to believe that the personalization of a competency is not going well, or whenever the performance of a competency is inadequate, the student is routed through a "corrective decision" loop wherein he may, upon further diagnosis, be routed to any of a variety of corrective experiences. These can vary from conferencing designed to facilitate the personalization process, to cycling through an enabling subsystem, to recycling through the learning experience just attempted. The critical point is that a mechanism to facilitate the personalization process is always available and that its use is mandatory. The relationship between the personalization process and the learning experiences within an instructional system that lead to the development of a professional competency is illustrated schematically in Figure 5.

Instructional Guideline 6. Teaching competencies should be demonstrated to criterion under laboratory conditions prior to the assumption of supervised responsibility for the learning of children in the schools, and they must be demonstrated to criterion under classroom conditions prior to the assumption of full teaching responsibility.

If the aim of teaching is learning, then there should be evidence that teachers can bring learning about before they assume responsibility for the learning of children. At a beginning level, such evidence

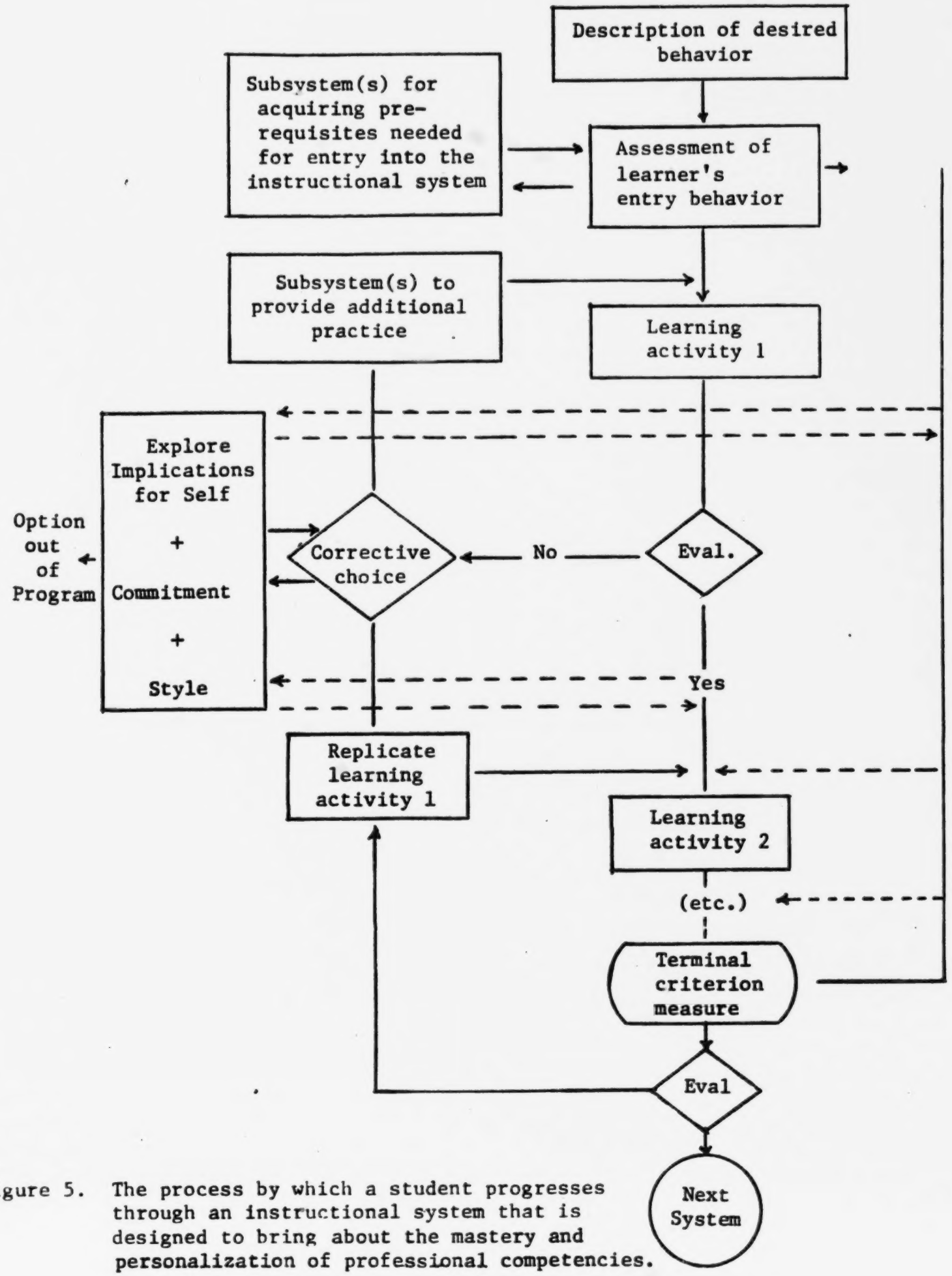

Figure 5. The process by which a student progresses through an instructional system that is designed to bring about the mastery and personalization of professional competencies.

can be obtained under laboratory or simulated conditions. Here competencies can be demonstrated in circumstances where the complexity of the teaching-learning situation can be controlled and the danger of negative consequences for children reduced. Once competencies have been demonstrated, even though they have been done so under simplified conditions, it is reasonable to assume that prospective teachers can enter live classroom situations with supervision and perform reasonably well. Before assuming full responsibility for guiding the learning of pupils, however, the full range of teaching competencies that have been identified as critical need to be demonstrated within the context of the ongoing classroom. Moreover, the full range of competencies needed to perform the noninstructional tasks required within a school situation must also be demonstrated. Certification as a fully responsible teacher can be justified when there is evidence that prospective teachers have both sets of competencies.

The commitment to have prospective teachers systematically demonstrate competencies in the ongoing classroom prior to certification has far reaching implications for the structure and organization of teacher education programs. Operationally it means that a large portion of the time spent in a professional education sequence will be spent in the schools and that teachers within the schools will have to be trained so that they can carry the supervisory demands of the program. It also means that the schools must have greater responsibility and representation in planning and maintaining the program. These factors, in combination with the change demanded by the program on the nature of instruction within the college, will fundamentally alter the organization and operation of teacher education as it is known today.

Rationale Underlying the Development of the Management Model

Management Guideline 1. A systematically designed model to manage a ComField based instruction program should be developed.

Every instructional program has to be managed. In most programs these functions are taken as a matter of course; administrators, registrars, counselors and maintenance personnel are unquestioned elements in program operation. Obviously, in a ComField based program, these same supporting functions must be provided, but because of the individually paced, personalized and largely self-instructional nature of such a program they must be provided in a somewhat different form. A ComField based program also requires that additional functions be available. The demand of the model for continuous program evaluation and adaptation, for example, or for mutually supportive working relationships between schools and colleges, requires that both an

evaluation and a relatively unprecedented adaptive function be built into such a program if it is to operate as planned. As a consequence, specifications for the functions needed in support of the ComField instructional model are critical adjuncts to the instructional model itself.

Management Guideline 2. The systems design principle of corrective feedback should be applied within each of the parts of the ComField model as well as to the model as a whole.

As pointed out earlier the ComField model is an evolving management model as well as the instructional model. In a ComField based instructional program at least four kinds of feedback are needed:

1) feedback on the appropriateness of the pupil outcomes that have been selected as guides in determining the competencies to be developed in prospective teachers. Are the ultimate objectives of the program the correct ones?

2) feedback on the effectiveness of teachers who have given competencies to bring about outcomes desired in pupils. Are the competencies that have been identified as relevant to given outcomes the correct ones?

3) feedback on the effectiveness of instructional systems in bringing about the competencies for which they were designed. Are the procedures used in the teacher education program effective? and

4) feedback on the impact of the ComField based program beyond its immediate influence on teachers and pupils. Is the school or larger social system changed as a result of the program?

Feedback on the various components within the management model is relatively simple: is each component within the system performing the function for which it is intended? A major requirement of the management model is provision for the kinds of corrective feedback needed by both the instructional and the management efforts.

Management Guideline 3. Cost data should be provided for all operations within a ComField based teacher education program, as well as the program as a whole.

Two arguments underly this specification: 1) educators have an obligation to provide to taxpayers and legislators cost/benefit information so that they can make informed judgments when asked to

support education; and 2) managers of ComField based programs must have cost/effectiveness information in order to make informed judgments as to program operation, priorities, etc. The commitment requires that a costing function be added to and integrated within the overall ComField Management Model which can meet two demands:

1) an accounting of the resource requirements (full system costs) needed to operate and maintain ComField; and

2) the provision of cost/benefit and cost/effectiveness statements reflective of system products.

Management Guideline 4. A computer based information management system needs to be developed to serve the ComField Instructional Management Models.

The information demands within a ComField based instructional program are high. As students progress through an instructional system they must have information that permits them to make appropriate choices as to next learning steps; advisors must be able to call up performance histories; etc. Information needs are also high within the management effort: instructional systems development personnel must have performance records for each system and/or sub-subsystem; cost/benefit and program evaluation data must be available upon call to those responsible for the adaptation or execution of the program, etc. To meet these demands a computer based information management system is to be used as the primary means for the storage, retrieval, transmission and display of information within a ComField based teacher education program. A computer system adaptive to "natural language" will be used.

IV. Specifications for the ComField Instructional Model

The guidelines followed in the development of the ComField model dictate in broad outline what the instructional program within the model is to be: e.g., instructional systems are to be designed to bring about competencies in modifying the behavior of pupils, provisions are to be made whereby students can evolve a preferred teaching style, criterion performance is to be demonstrated under live classroom conditions prior to certification. They do not, however, dictate what competencies are to be developed, or how the personalization of competencies are to take place, or when the demonstration of competencies under live classroom conditions are to occur in relation to other aspects of the program. The same thing holds with respect to the management model. A cost/effectiveness and a corrective/adaptive function has to be included, a computer based information management system has to be established, and whatever else that is needed to make the instructional program operate has to be provided, but the guidelines do not dictate in any way how these should work or what they should contain. That is the purpose of specifications.

Two levels of specifications are provided, those that establish the broad parameters of the model and those that translate those parameters into program development. The first has been labeled Model Specifications and the second Program Specifications. Ultimately specifications will have to be established that translate Program Specifications into specifications for the actual operation of a program, but that is a level of detail beyond that to be provided by a model. The aim of this section of the report is to make explicit the Model Specifications and the rationale which underlies them. Specifications at the model level have been prepared for both the instructional and the management models.

Content Specifications

Content Specification 1. The content of the instructional program shall be designed to prepare Instructional Managers for schools in the 1970's.

In order to plan an instructional program meaningfully, some prediction as to the nature and purpose of education in the 1970's and beyond has to be made. Two predictions have been agreed to by the planners of ComField.

1. A functional science and technology of education will evolve, and it will bring with it an educational program that is markedly different from that which is now found in most schools. Two differences are anticipated: 1) the widespread use of pupil-materials instruction, and 2) the application of systems technology in the design of instructional experiences. Out of both will grow the application of "instructional systems" to the education of children.

2. Three major classes of educational specialists are anticipated: 1) instructional analysts, 2) instructional designers or engineers, and 3) instructional managers. As presently conceived the instructional analyst will be the member of the instructional team primarily responsible for identifying the classes of pupil outcomes for which the school should be responsible, and the instructional conditions that bring them about; the <u>instructional designer-engineer</u> will have the task of developing instructional systems to bring these outcomes about; and the instructional manager (IM), will bring the effort of the first two members to bear upon the educative process. The task of the IM is viewed as one of creating and/or maintaining an instructional environment that brings about learning in children. The IM's specific function within the school is likely to be primarily a <u>supervisor</u> of the instructional process rather than the prime <u>manipulator</u> of it. Operationally this means that while while the IM of the future must be able to diagnose learner readiness, prescribe appropriate learning experiences, evaluate their effectiveness and prescribe next learning steps, he must also be able to apply the instructional systems developed by the other members of the educational team, supervise instructional assistants, use electronic and computer media, etc.

On the basis of these predictions, the ComField instructional model was designed to prepare instructional managers. In the future it may be expanded to prepare instructional designer-engineers or instructional analysts, but this is not its purpose at the moment.[1]

Content Specification 2. One block of content within the instructional model shall be designed to prepare prospective IM's for their role as facilitators of desired outcomes in children. (Role I of the Instructional Manager.)

In keeping with a systematic approach to program development, two steps are required before being able to specify the content required to prepare the prospective IM for this role: 1) an analysis of the tasks to be carried out within the role, and 2) an analysis of the competencies needed to perform each task.

CONTENT DERIVING FROM TASK ANALYSIS. The products of the task analysis for Role I of the prospective IM are the classes of pupil outcomes to be realized. For purposes of a model these need to be defined extremely broadly, for in the future education is likely to assume more and more responsibility for the development and well-being of children. From this point of view it is critical that prospective IM's become aware of and committed to the full range of outcomes that need to be attended to if children are to reach their full potential. These obviously extend beyond the three R's, and well beyond the familiar threeway classification of cognitive, affective and psychomotor outcomes. Concern needs to be directed to the issues of health, emotionality, identity, sexuality, aggressiveness, tenderness, relatedness and all the other qualities that lead to humanness, as well as to outcomes in the psychomotor, intellectual and attitudinal domains. A first approximation to a taxonomy of pupil outcomes that reflects this breadth appears as Appendix A.

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[1]The distinction between instructional analysts, designer-engineers and managers has been drawn more sharply here than it is likely to be in actual school operation. It is anticipated that these various personnel will function genuinely as a team, and as such, each member of the team will have an active voice in the pursuit of all three functions. In some instances it may even be that one person will serve several functions, though because of the specialization involved this is not likely to be a common practice.

CONTENT DERIVING FROM COMPETENCY ANALYSIS. Given the pupil outcomes desired, the products of the competency analysis for Role 1 are of two kinds: 1) the conditions required to bring the specified pupil outcomes about, and 2) the competencies required to provide these conditions.

While the rationale for a competency analysis is straightforward, the available information base unfortunately does not permit it. With few exceptions the educational and behavioral science literature is lacking in the kind of tested, empirically based evidence that permits one to identify with any degree of confidence the set of conditions or operations that give rise to specific classes of pupil outcomes. It is difficult, for example, to identify explicitly and with confidence the instructional conditions which permit concepts to be mastered, attitudes to be modified, or chronic anxiety to be reduced. It is even more difficult to specify the conditions for bringing about such outcomes as trust or considerateness or self-understanding, or attempting to specify the conditions for the realization of any outcome specific to a particular kind of learner in a particular kind of instructional setting. As a consequence an alternative strategy was pursued in the identification of content relating to the development of the competencies IM's need to effect appropriate change in the behavior of pupils.

At the first level the strategy involves specifying a model of instruction and deriving from the model the major repertoires of knowledge needed to perform effectively within its context. At the second level it assumes the mastery of these repertoires by prospective IM's and, with appropriate practice, being able to apply them effectively to instruction in an ongoing educational setting. Two factors make this strategy unique.

1. A relatively powerful model of the instructional process was used as a guide in the development of content. The model holds, in effect, that any instructional act depends upon the interaction of five sets of variables: 1) the pupil outcome desired, 2) the characteristics of the learner which interact with instructional conditions to effect outcome, 3) the characteristics of the instructional setting which interact with learner characteristics to effect outcome, 4) the nature of the instructional act per se. As used in ComField, the term instructional act always includes reference to both the content of and the strategy represented by an instructional behavior.

2. Prospective IM's are required to demonstrate that they can make appropriate mixes of these four sets of variables under both simulated and real-life conditions; that is, they have to demonstrate in both the laboratory and on-going classroom that they can bring about appropriate behavior changes in pupils.

Four blocks of content derive from the analysis of Role I: classes of learner outcomes, learner characteristics, the elements or strategies of the teaching act, and conceptual frameworks through which subject matter can be taught.[1] As used in ComField conceptual frameworks represent an effort to bridge the gap between the nature of subject matter, which is obtained outside of the professional education program, and the strategies for teaching it. Two examples of such a framework appear in Appendices B and C. The model specifies that conceptual frameworks be established for all subject matter areas to be taught in early childhood or elementary education programs.

The major blocks of content relevant to the development of competencies needed to perform Role I are summarized in Table 1.

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[1]Members of the task force responsible for designing program specifications for the development of Role I competencies found it advantageous to include setting variables as a dimension of the instructional environment to be manipulated, and as such included it within the block of content that deals with instructional strategies. To be consistent with task force efforts, only four blocks of content will be considered as deriving from the present analysis of Role I: learner characteristics, instructional strategies, conceptual frameworks for teaching subject matter areas, and learner outcomes.

Table 1. A summary of content in the ComField instructional model that leads to the development of the competencies needed to bring about desired outcomes in pupils.

	Conceptual frameworks for teaching subject matter needed to bring about selected pupil outcomes	
A taxonomy of pupil outcomes	Instructional strategies needed to bring about selected pupil outcomes	Characteristics of pupils which interact with content and strategy to effect outcomes

Content Specification 3. One block of content within the the instructional model shall be designed to prepare prospective IM's for their role as performer of the noninstructional tasks required within a school (Role II of the Instructional Manager).

CONTENT DERIVED FROM TASK ANALYSIS. The tasks to be performed by an IM above and beyond his responsibility for the development and well-being of children will depend to a large extent upon the nature of the educational environment in which he is working. As indicated earlier the ComField model is based on the premise that the educational environments of the future will be markedly different than they are today, and as a consequence Role II functions are also likely to be different. Four major changes are predicted for education that will affect Role II functions:

1. increased responsibility for research and evaluation within the context of ongoing educational programs

2. increased individualization of instruction through use of predesigned instructional systems, electronic media and computer technology

3. increased dependency upon instructional aides or assistants

4. participation in administrative decision making regarding policy, curriculum and school management

In addition to these newer tasks, the IM of the future will in all likelihood have to serve many of the same auxiliary functions he performs today, i.e., participation in such administrative functions as record keeping, the management of school facilities, materials and supplies; conferencing with parents; and working with professional education organizations. While the projection of Role II tasks for the IM of the future cannot be done with complete accuracy at this point in time, "educated guesses" can be made. A first approximation at such task analysis appears as Appendix D.

CONTENT DERIVED FROM THE COMPETENCY ANALYSIS. The analysis of competencies needed to perform Role II tasks involves a somewhat different process than that used with Role I. Rather than point to well-defined outcomes as a point of departure, and letting competencies be dictated by what is known empirically about the conditions required to bring them about, Role II tasks can be only generally defined, and the competencies needed to perform them only generally surmised. Working cooperatively with a research team or supervising instructional assistants are cases in point. In this sense competencies in the service of Role II functions serve a broad range of related functions rather than relatively specific ones.

The major blocks of content relevant to the development of competencies needed to perform Role II tasks are summarized in Table 2.

Table 2. A summary of content in the ComField instructional model that leads to the development of competencies needed to perform noninstructional tasks.

A taxonomy of noninstructional tasks to be performed by an instructional manager	Ability to work as a member of a team in research and evaluation, instructional systems development, and supervision of assistants; ability to utilize computers and electronic media in instruction	Ability to conference with parents, work with peers, establish school policy, pursue administrative tasks such as maintenance of records, etc.

Content Specification 4. The content of the instructional program shall be designed to develop general purpose skills that can enhance or facilitate the application of professional competencies.

The minute-by-minute performance of Role I tasks is dependent to a large degree upon the general adaptive capability of an IM, that is, his ability to collect and process information, generate hypotheses, implement and test the most promising of these, act upon the data that comes from the test, etc., and upon his ability to interact with students individually and in groups. Generally speaking, interpersonal competence depends upon general communication skills, group process skills, conflict management, etc. The performance of Role II tasks carries the same demands. As a consequence an important adjunct to the competencies required by an IM to perform Roles I and II is the development of general purpose competencies that act to enhance or facilitate those that have been described previously.

The major blocks of content that relate to the development of skills that enhance or facilitate the application of Role I and Role II competencies are summarized in Table 3. Exemplary taxonomies of general adaptive competencies and interpersonal competencies appear as Appendices E and F respectively.

Table 3. A summary of content in the ComField instructional model that leads to the development of interpersonal or facilitating competencies.

General adaptive competencies	Interpersonal competencies

Content Specification 5. The content of the instructional program shall be designed to provide for the personalization of all competencies.

Three factors are considered to be essential in order that the personalization process occur:

1. the development of self-understanding

2. the clarification of commitment to the various professional competencies to be mastered, and

3. the integration of professional competencies into a unique and personally relevant teaching style

Two steps are involved in the personalization process: 1) developing an initial understanding of one's self, one's value structure, and one's orientation to teaching style; and 2) reflecting the professional competencies as they are being developed against this complex of factors. As discussed in Instructional Specification 5, the first step assumes the form of a set of related instructional systems, and the second a set of experiences which parallel all instructional systems that have as their aim the development of professional competencies.

The major blocks of content relevant to the personalization process are summarized in Table 4. Table 5 contains a summary of all of the blocks of content included within the ComField Instructional model.

Table 4. A summary of the content of the ComField instructional model that permits the personalization of professional competencies.

Self-understanding	Commitment	Teaching Style

Organizational Specifications

Organization Specification 1. A ComField based instructional program shall be organized into three phases: Foundations, Laboratory and Practicum.

Four major classes of activity dominate a ComField based instructional program:

1. demonstration of instructional and interpersonal competencies under simulated classroom conditions (the Laboratory phase)

2. demonstration of instructional, noninstructional and interpersonal competencies under live classooom conditions (the Practicum phase)

3. demonstration of mastery of the blocks of knowledge prerequisite to 1. and 2. (the Foundations phase)

4. demonstration that all of the above have been integrated into a unique and personally relevant teaching style

Generally speaking, the first three classes of activity follow one another in time; the Foundations phase of the program precedes the Laboratory and the Laboratory precedes the Practicum. This is not a fixed sequence, however, for the program is structured in such a way that students may begin work toward mastery of a competency by attempting its performance in the Laboratory. The basic operating principle underlying the relationship between the Foundations and Laboratory phases of

Table 5. A conceptual framework which summarizes the major blocks of content within the ComField instructional program[1]

Content relevant to the development of competencies needed to bring about desired outcomes in pupils	A taxonomy of pupil outcomes	Conceptual frameworks for teaching subject matter needed to bring about selected pupil outcomes Instructional strategies needed to bring about selected pupil outcomes	Characteristics of pupils which interact with content and strategy to effect outcomes	Content relevant to the personalization of professional competencies Self understanding Commitment Teaching style
Content relevant to the development of interpersonal or enhancing competencies	General adaptive competencies	Interpersonal competencies		
Content relevant to the development of competencies needed to perform non-instructional tasks	A taxonomy of noninstructional tasks to be performed by an instructional manager	Ability to work as a team member in research and evaluation, instructional systems development, and the supervision of assistants; ability to utilize computers and electronic media in instruction	Ability to conference with parents, work with parents, work with peers, establish school policy, pursue administrative tasks such as maintenance of records, etc.	

[1]All blocks of content can be adapted equally well to the preparation of I.M.'s at the preschool, primary or elementary levels.

the program is simply one of responding to individual differences in students and empirical evidence as to how a competency seems best to be learned.

The relatively permissive relationship between Foundations and Laboratory is not carried over to either the relationship between Foundations and Practicum or Laboratory and Practicum. While some Foundations work and some recycling to Laboratory experiences may continue throughout the Practicum, there is a rather rigid line between the Laboratory and Practicum. Students must demonstrate competency in bringing about appropriate behavioral change in pupils under simulated classroom conditions before they assume responsibility for their learning in real-life conditions. This is the case even though supervision occurs in the Practicum.

The requirement of competency demonstration in the Laboratory before entry into the Practicum has implications for progress through the program. Passage is dependent upon criterion performance; if a student is able to meet criterion on designated competencies when he enters the program, nothing is to keep him from moving immediately into the Practicum phase. If, on the other hand, he is unable to reach criterion performance, he will never enter the Practicum. This is the case no matter how long he is allowed to remain at the Foundations-Laboratory level. The Com-Field instructional program is a performance based program, not a time or course dependent one.

The Practicum also requires performance to criterion before recognition as a certified career teacher. Like the Laboratory, time or credit hours bear no direct relationship to progress through it. It is different from the Laboratory, however, for it is possible for a prospective IM to remain in the Practicum relationship indefinitely; the only requirement for his remaining there is a school's willingness to continue supervision.

The relationship between the Foundations, Laboratory and Practicum phases of the program is illustrated schematically in Figure 6.

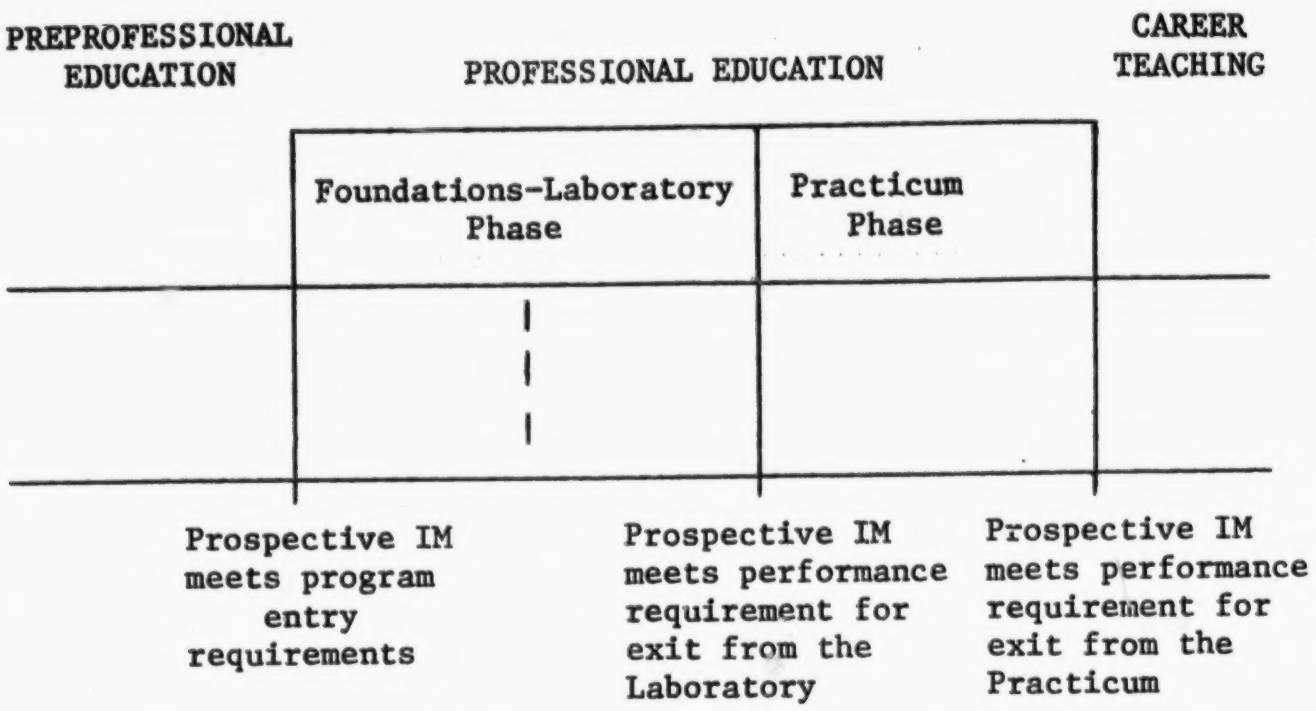
PREPROFESSIONAL EDUCATION
PROFESSIONAL EDUCATION
CAREER TEACHING
Foundations-Laboratory Phase
Practicum Phase
Prospective IM meets program entry requirements
Prospective IM meets performance requirement for exit from the Laboratory
Prospective IM meets performance requirement for exit from the Practicum

Figure 6. A schematic representation of the relationship between the Foundations, Laboratory and Practicum phases of a ComField based instructional program.

Organizational Specification 2. Four levels of certification shall be incorporated within a ComField based instructional program.[1] 1) a Preparatory Certificate (permits entry into the Laboratory phase of the program); 2) an Initial Certificate (permits entry into the Practicum); 3) a Continuing Certificate (permits entry into the field as a career teacher); and 4) a Consultant Certificate (permits supervision of ComField students within the Practicum phase of the program.

The rationale for the various levels of certification is straightforward: before a student assumes responsibility for the learning of students, even though it may be only in a simulated classroom environment, he should demonstrate that he is able to assume that responsibility. As responsibility increases, demand upon the demonstration of competencies also increases. Certification at the Preparatory level requires evidence that a student has

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[1]These levels of certification correspond to those proposed by the Washington State Department of Education (see Statements of Standards For Preparation of School Professional Personnel: Fourth Draft).

the knowledge and/or experience that permits him to interact constructively with students; certification at the Initial level requires evidence that he can bring about appropriate changes in the behavior of pupils under simulated classroom conditions; certification at the Continuing level requires evidence that he can bring about appropriate changes in the behavior of pupils under live classroom conditions, perform noninstructional tasks effectively, provide a rationale for his behavior, etc.; and certification at the Consultant level requires evidence that he can effectively supervise prospective IM's in the Practicum.

Organizational Specification 3. The three phases that comprise a ComField based instructional program shall be integrated functionally with the general education requirements of a college and the inservice education requirements of a school.

Any professional education program must fit within the constraints of the institutions within which it rests. Within the college setting the Laboratory and Foundations programs must mesh with the general education requirements of the college. Within the school setting the Practicum program must mesh with the practical demands of instruction. As it is planned, a ComField based program should offer no great difficulties on either count. At the college level it is assumed that the professional education program will require one-third of the time spent in obtaining a baccalaureate degree. At the school level it is assumed that on the average students will spend two to three years in the Practicum. During this time they will be employed as interns. As such, it is assumed that within a reasonable period of time they will return as much to a school as they take from it.

One major complicating factor in the program is the dependency of the Practicum experience upon qualified supervisors in the schools. Supervisors must be able to judge behavior as reflective of criterion standards and they must be able to instruct or advise so as to bring behavior to criterion when it is below standard. In a systematically designed performance based program like ComField these are demanding requirements. As a consequence, one of the major tasks facing institutions implementing a ComField based program is the preparation of a cadre of teachers in the schools that can serve as supervisors in the Practicum program. The basic skills required by a supervisor in the Practicum can be inferred from the description of the basic training model for the Practicum (see Appendix G).

An approximation of the relationship of the phases within a ComField based instructional program to the general education requirements of a college and the inservice education requirements of a school are presented in Figure 7.

Organizational Specification 4. The content of the instructional program shall be ordered systematically into the phases of the instructional program.

The major blocks of content that comprise the ComField instructional model must be ordered across time and in relation to phases of program activity. This has been done and is summarized in Figure 8. By and large this placement follows the logic that underlies movement from the Foundations phase of the program to the Laboratory to the Practicum.

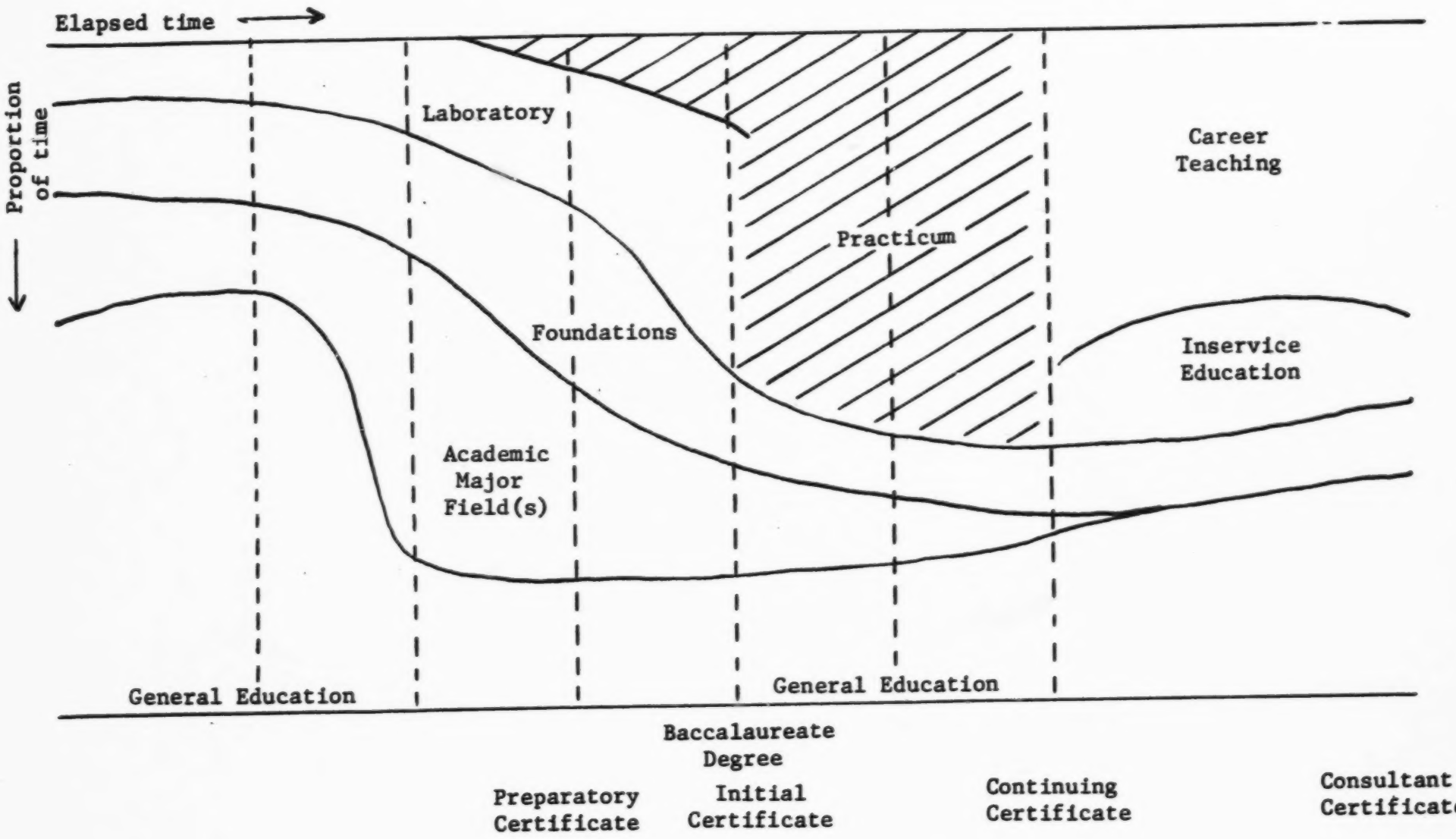

Figure 7. A proportional representation of time spent in the phases of professional development against elapsed time.

GENERAL EDUCATION	PROFESSIONAL EDUCATION				
	Foundations-Laboratory Phase			Practicum Phase	CAREER TEACHING
Knowledge prerequisite to successful performance in the Foundations-Laboratory Phase of Comfield	Mastery of repertoires of knowledge essential to the performance of the teaching act	Mastery of repertoires of knowledge dealing with the elements and strategies of the teaching act	Demonstration of competencies which bring about desired learning outcomes in children	Demonstration of competencies which bring about desired learning outcomes in children	Knowledge prerequisite to successful performance as a supervising teacher in the Practicum Phase of Com-Field
				Demonstration of competencies which lead to the successful performance of noninstructional tasks	
	Mastery of repertoires of knowledge essential to the performance of general adaptive and interpersonal skills		Demonstration of competence in the performance of general adaptive and interpersonal skills	Demonstration of competence in the performance of general adaptive and interpersonal skills	
	Mastery of repertoires of knowledge essential to the development of self-understanding, commitment and a preferred teaching style		Demonstration of behavior acceptable as evidence of self understanding, commitment and a preferred teaching style	Demonstration of behavior acceptable as evidence of self-understanding, commitment and a preferred teaching style	
Prospective IM meets program entry requirements			Prospective IM meets performance requirements for exit from the Foundations-Laboratory Phase	Prospective IM meets performance requirements for exit from the Practicum Phase	

Figure 8. A conceptual framework for summarizing the organization of the major blocks of content within the ComField instructional model.

V. Specifications for the ComField Management Model

Content Specifications

Content Specification 1. The management model shall contain the support functions required to permit a ComField based instructional program to operate.

In order to operate, the ComField Instructional Model requires eight support functions: 1) management of the instructional process per se, that is, managing teaching-learning interactions; 2) development of the instructional systems for use in the program; 3) continuous evaluation of the effectiveness and appropriateness of the program as a whole; 4) continuous adaptation of the program in light of its systematic appraisal; 5) program execution; 6) personnel selection and training; 7) maintenance of equipment, supplies and facilities; and 8) maintenance of the information management system needed to permit all of the above to occur.

Content Specification 2. The management model shall contain a supporting function designed to provide cost/effectiveness data on all operations within a ComField based program, as well as the program as a whole.

Two demands are placed upon such a function:

1) an accounting of the resource requirements (full system costs) needed to operate and maintain ComField; and

2) the provision of cost statements reflective of product costs, effectiveness and impact.

Organizational Specification

Organizational Specification 1. The management model shall be organized in such a way that all functions within it will have as their aim the enhancement of instruction.

Too frequently the founding purposes of programs are lost sight of or are relegated to a position of secondary importance as time passes and the demands of operation take their toll. With so many functional components needed in its support a ComField based program is particularly susceptible to this threat; any of the support components could readily become "an agency unto itself." The management

model presented in Figure 9 is the result of an effort to create an organizational operational framework that protects against this kind of danger.[1] Conceptually, it:

(a) places the instructional program squarely in the center of things,

(b) stresses the idea that information and directional influence flows both from the instructional component to the support units and vice versa, and

(c) provides for a continuous flow of information to the policy-adaptive component and hence to the program execution component.

While such a model cannot guarantee that all units within a ComField based program will act in concert, it does provide an operational framework which at least makes it possible.

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[1]It needs to be pointed out that the labels within the boxes in Figure 9 refer only to the functions that must go on in the management system; they do not speak to who performs these functions or the manner in which they should be carried out. For example, the box labeled Policy and Adaptation indicates that the functions of establishing ComField policy, translating policy into operational guidelines, deciding upon new and/or modified program operations, carrying out inter- and intra-institutional coordination, etc., must be accomplished. The model does not specify the nature of the organizational structure needed to carry out these functions.

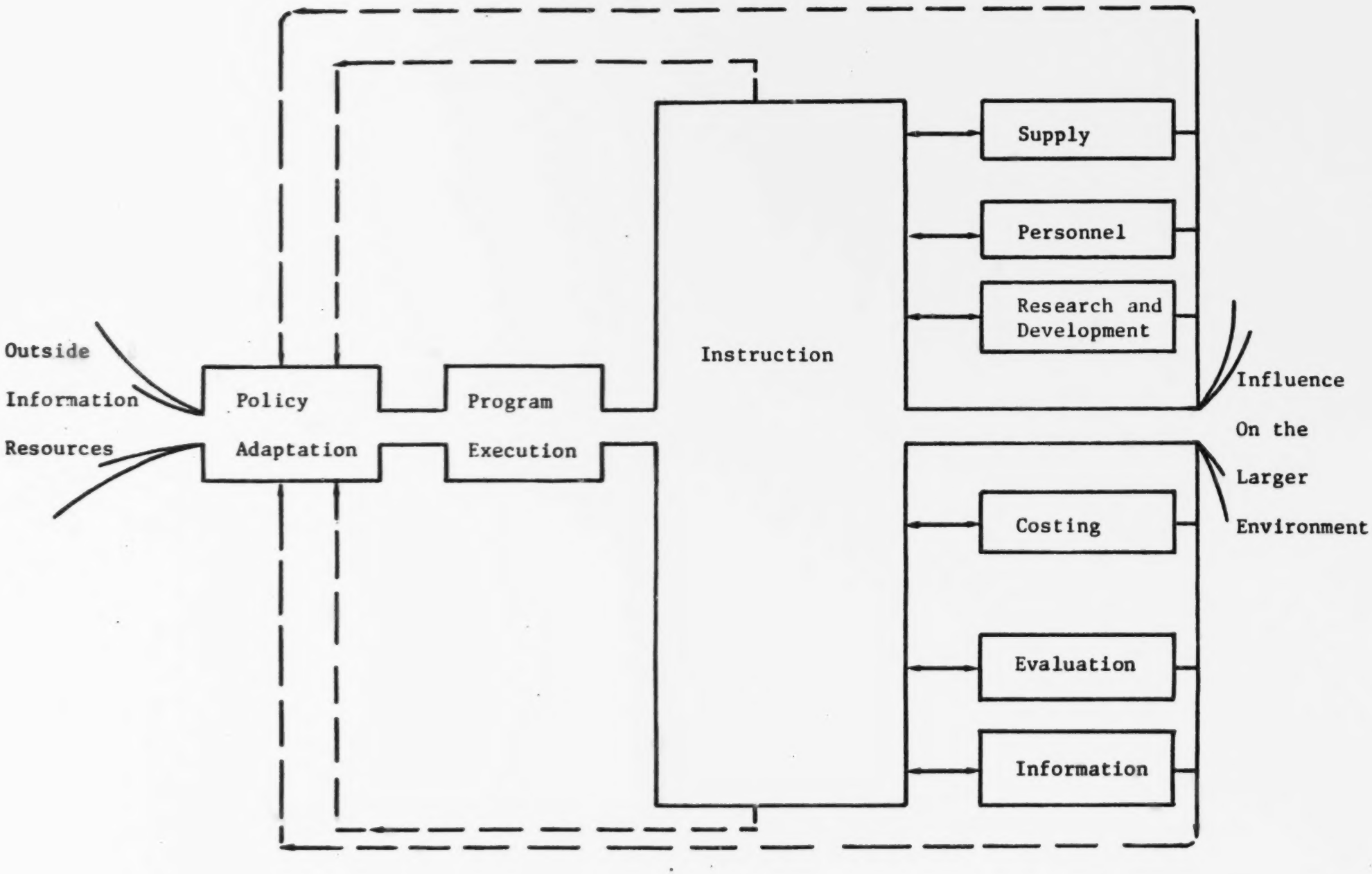

Figure 9. Schematic Diagram of the ComField Management System